

Appln. No. 10/626,472
Amendment dated May 30, 2006
Reply to Office Action mailed January 30, 2006

Amendments to the Specification:

Please replace paragraph [0048] with the following amended paragraph:

[0048] In a sixth variant of the invention, a patterned microgel, formed as described in variant three or variant four, is loaded with a ~~drug~~ bioactive agent, complex or other type of molecule, which is then released in a controlled manner by altering the environmental conditions of the microgel (e.g., by altering the environmental pH or ionic strength). In such circumstances, the molecule can be said to be "reversibly bonded" to the microgel (i.e., bonded by a phenomenon such as charge-bonding or hydrogen-bonding, so that the bonds may be broken by altering environmental conditions). Such reversible bonding is often referred to as adsorption when a molecule bonds reversibly to a structure such as microgel. A bioactive agent may be any physiologically or pharmacologically active substance that is soluble in water. Such agents include drugs, proteins, peptides, genetic materials, nutrients, vitamins, food supplements, fertility inhibitors, fertility promoters, vitamins, nutrients, or the like. In an example of this variant, the patterned microgel is loaded by immersion in an aqueous solution containing a ~~drug~~ molecule bioactive agent, complex, or other molecule having a net charge or hydrogen-bonding moiety that is complementary to the charge or hydrogen-bonding moiety of the microgel. For example, a PMM microgel at pH>4 will have a net negative charge and, therefore, the ~~drug~~ bioactive agent, complex, or other molecule should have a net positive charge in order to load efficiently into the microgel. The microgel is then rinsed in a buffer solution of the same pH.

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The microgel can then be held at this pH for an extended period, for example, days, weeks, or months, depending on the specific system. Release of the loaded molecule is triggered by exposing the microgel to an aqueous solution containing lower concentrations of such molecule, down to none, of the loaded molecule and having a pH that is different than the loaded pH. The change in pH decreases the affinity of the microgel for the loaded molecule, which is then released into the environment of the microgel. Other aspects of this variant are disclosed more fully in the co-pending, co-owned U.S. patent application Serial No. 10/624,993, published as U.S. Publication No. 2004/0137039, entitled METHOD FOR CONTROLLED RELEASE OF MOLECULES FROM LAYERED POLYMER FILMS by S. Sukhishvili and E. Kharlampieva, filed in the United States Patent and Trademark Office on Jul. 22, 2003, the disclosure of which is incorporated herein by reference.